

R-NRM

M-1

Silvicultural Work Plans

Priest River Forest

PROJECT 1201 FILES

September 9, 1938

MEMORANDUM CONCERNING POSSIBILITIES
OF SILVICULTURAL WORK ON THE
PRIEST RIVER EXPERIMENTAL FOREST

The following report and attached map are the results of a fairly intensive examination made of the Priest River Experimental Forest during the latter part of August to determine possibilities of silvicultural work. In brief, the outstanding impression gained from the examination is that there is no big stand improvement job to be done on the Forest. Nevertheless, there is a considerable amount of silvicultural work that can and should be done, not necessarily nor desirably all at once but over a period of years. It is estimated that sufficient work exists to keep a crew of 15-25 CCC men busy 8 months a year for the next 3 to 5 years. A description of the various silvicultural jobs which might be done follows. Numbers refer to numbered areas on the attached map.

Weedings and Cleanings (1)

The area of the Experimental Forest having stands less than 20 years of age is very small and the area of these stands which probably can be benefited by cleanings is even more limited. At the present time it is hardly worthwhile to do any of this type of work, but within the next five years a considerable portion of the 1922 burn, especially that portion in Benton Creek, (about 30 acres) should be

worked over and pine reproduction released whenever overtopped by other species. It might be desirable on parts of the area to release the reproduction from brush competition. This work can best be done in the fall of the year when the leaves are gone from the dense brush cover and the reproduction is most visible.

Thinnings (2)

If intensive forestry could be practiced on the Experimental Forest, if markets for material of small sizes were existant, then thinnings would probably be the most profitable and worthwhile stand improvement measures which might be undertaken on the forest. The major portion of the forest is covered with an intermediate age class which might be benefited to a greater or less degree, depending on the site and stand conditions, by removal of certain trees. But as no market for small material exists, as crude forestry probably at present is the soundest forestry, little is to be gained by making thinnings in most of the stands.

Inasmuch as none of the material removed in thinnings can be utilized, any work which will materially increase the rate of growth is certain to cost almost as much as the final crop now brings. It would seem undesirable, therefore, to undertake thinnings except on an experimental scale until

such time as the material can be sold and the real value of the thinning realized.

Almost all stands in both Benton and Canyon Creeks show good expression of dominance- the usual characteristic of stands of the white pine type. In many of these western larch is dominant with white pine in an inferior position. The only effective method to release the pine would be to remove the larch. This, however, would mean cutting the finest trees in the stand; the volume wasted would more than offset increased white pine growth. To thin from above in such stands would seem the poorest kind of forestry.

On certain areas, not very extensive in size and located mainly in Canyon Creek, the stands have an appearance of stagnation. On these, as on most all north slope areas in Canyon Creek, there is a dense cedar understory. Increment borings on one of the poorest of these areas showed an average d.b.h. growth per decade of the dominant and codominant white pines of 0.5 inch. It is entirely possible that actual stagnation is the cause of this slow rate of growth. But it is just as possible that site conditions, mainly of soil, are the cause. The soil of most of Canyon Creek is rather shallow underlain with rock. It is entirely possible that in many areas the shallow soil and the rock structure beneath allow rapid percolation of water to such an extent that insufficient moisture is available for a good rate of tree growth. On such sites a reduction of the number of

stems might increase the rate of growth of the remaining trees but such work could not transform a poor site into a good one.

It is recommended that experimental thinnings be made to test the effects of thinning in such stands. These thinnings could be made in two or three areas and the total acreage involved would not need to be greater than 20 to 40 acres to make a real test. A number of treatments to compare with untreated areas might well be tried. For example, the following are suggested:

- a. Remove understory; no thinning in overstory.
- b. Remove understory and thin in overstory.
- c. Thin understory, leaving only the best cedars; no thinning in overstory.
- d. Thin understory leaving only the best cedars; thin overstory to favor dominants and codominants.
- e. No thinning in understory; thinning in overstory to favor dominants and codominants.
- f. Check, unthinned in both understory and overstory.

It would seem worthwhile to make these experimental thinnings if for no other purpose than to study their effects on the cedar understory. But thinnings, other than experimental, would seem very undesirable.

The experimental forests provide the best chance to demonstrate ⁷⁸~~sould~~ silviculture. Experimental operations, may or may not be impractical for they are made to study

certain treatments and their effects.

But any extensive silvicultural operations which go beyond the experimental stage - should be the soundest and most practical of operations and those to be recommended to the Region. If they are not practical, they are more of a liability than an asset.

The desirability of any experimental silvicultural work involves its basic need and the manner it fits into the program of silvicultural research. Any study of silvicultural operations to be of research value involves a good deal of technical supervision in planning, plot layout, cutting supervision, and record taking. It is impossible merely to write specifications of silvicultural jobs and ~~expect~~ the treated area to be of much permanent research value without some intensive plot installation. And plot installations are costly both in time and expense.

Pruning (3)

Opportunities for pruning work, mainly in young ponderosa pine stands, are quite abundant. The Fox Creek ponderosa pine plantations, on upper and lower Fox Creek, and the plantation of this species between the Knoll and the river should be worked over sometime within the next five years and crop trees pruned to a height of 5-7 feet. The white pine reproduction near the Knoll plot will be used this fall for a study of pruning in relation to decay. The ponderosa pine spacing and class of stock plantation near the source of seed plantations will be used for this same purpose.

By far the greatest opportunities for pruning, however, are offered by the young stands of ponderosa pine on the south facing slope of lower Benton Creek and the southwesterly facing slopes of lower Ida and Canyon Creeks. Most of these trees are open grown and are making vigorous growth. If left untouched they will develop heavy, full crowns of coarse limbs and the bole will be composed of low grade material. Pruning here offers a chance to produce high grade material. Some trees can be pruned to a height of only 5 or 6 feet, others to a height of about 12 feet, and still others can be pruned to a full log length. It is recommended that only dominant and codominant, vigorous trees of ponderosa and white pine, 10 inches or less d.b.h. be pruned.

In the same stands a certain amount of thinning out of Douglas fir to release promising ponderosa pine trees might also be done.

A certain amount of pruning could also be done in young white pine stands between the county road and the river. But only vigorous fast-growing trees should be selected in any event.

Planting (4)

Several small areas on the forest should be planted. Portions of the 1922 burn not naturally restocked and of fair to good site probably should be reforested. The area between the gravel pit and the river-at present an example of an experimental cutting which failed to restock-should be planted. Portions of the old county road cut off by the new

road construction as well as other unused old roads might well be planted. The site of the old Benton Ranger Station is still another possible planting area and finally any new broadcast burn areas and any unplanted old broadcast burn areas should be planted.

It would seem that especial emphasis in planting should be given to the arboretum plantations along the county road. Any work which will improve the condition and appearance of the areas along this road would seem especially worthwhile.

Total acreage in need of planting is probably about 25 acres, more than half of which will require treatment to dispose of brush before planting.

Broadcast Slashings and Burns (5)

Rather large areas in Canyon Creek which are potentially good ponderosa pine sites are now covered with lodgepole pine. It is suggested that some of these areas be converted to ponderosa pine stands by broadcast slashings and burnings followed by planting.

Other broadcast areas will be mentioned in connection with timber sale possibilities.

Disposal of Defective Trees (6)

Defective hemlock and white fir trees are found quite abundantly over the forest. In certain areas mainly in immature stands it should be worthwhile to fell these trees and pile and burn the resulting slash. In mature and overmature stands it probably would be best to leave these trees until the time of logging and dispose of them at that time.

The 80 year white pine stand south of Benton Creek just

above the station contains many defective hemlock which should be felled. The hemlock might also be removed from the stand adjacent to the creek between the Benton Creek road bridge and the South Ridge road bridge over Benton Creek. Areas in Benton Creek drainage along the Center Ridge road should also be worked.

Probably the largest amount of this work - other than in the more extensive mature and overmature stands should be done in the north slope ravines of Canyon Creek. Along most of these ravines above trail #8 are patches of old-growth cedar intermixed with hemlock and white fir. The defective trees in many of the patches could be felled to advantage. But even here it probably would be well to delay this work until such time as the cedar can be sold inasmuch as broadcast burning at that time might be the best answer to the disposal problem.

Other areas where defective trees should be cut are mentioned in connection with timber sale possibilities.

Logging Operations

Inasmuch as approximately 1500 acres of the forest is covered with a stand of merchantable timber 120 or more years of age only about 1/3 of which is reserved from cutting, it would seem highly desirable to begin a series of small timber sales to utilize the overmature timber much of which is decadent, to break up the older stands and create young age classes suitable for future silvicultural research work, and to increase the demonstrational value of the forest. A series of small sales can be planned in such a manner that

small logging operations would be almost continuous from the present until such time as the younger age classes reach maturity.

According to the 1934 cruise the forest contains the following volume of sound merchantable timber:

<u>Species</u>	<u>Volumes, Bd. Ft.</u>
White pine	12,309,357
Larch	10,345,466
Douglas fir	9,252,333
White fir	1,844,999
Hemlock	3,841,089
Cedar	6,183,818
Lodgepole pine	930,394
Ponderosa pine	5,334,236
Engleman spruce	1,974,603
Alpine fir	2,082,077
Whitebark pine	601,183
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Total	54,699,555
Cedar poles	32,458

Probably less than half of the volume is really loggable.

But even so, the volume of merchantable timber is quite large and sufficient to carry small logging operations for a number of years.

Most of the ponderosa pine volume, $5 \frac{1}{3}$ million feet, is along the south-facing slopes of lower south ridge, center ridge, and north ridge. Probably $\frac{2}{3}$ of the volume is loggable

at the present time. In most of the stands younger age classes of ponderosa pine and Douglas fir occur beneath the veteran ponderosa pine. In general mortality exceeds growth in the older trees; silviculturally, little if anything is gained by holding them. In most cases a selection cutting in which only the veteran trees are removed should be a satisfactory method of cutting. In some stands a certain amount of work to release ponderosa pine from Douglas fir could be done in the young stands after logging the veteran trees.

The volume of white pine and cedar available for cutting depends upon how much is to be reserved in a natural area. I believe that the area which is at present recommended for dedication as a natural area is entirely inadequate and in many respects poorly chosen. It is, for the most part, grass-land, rock slides, sub-alpine and upper-slope, fringe-type mixtures of other types with subalpine- all types which will be extensively preserved without any formal dedication as natural areas. The acreage of typical overmature white pine type is indeed limited, most of the type included within the area being upper slope mixture with subalpine types. And the area is entirely lacking in a true climax stand! The nearest approach to a climax within the stand is the almost pure hemlock stand in Canyon Creek, but this is till far from climax.

The Experimental Forest contains, however, extremely fine examples of both climax stands and overmature white pine

stands. These are to be found mainly in Section 30 south of Benton Creek. I sincerely believe that these stands are of greater value reserved in their natural condition than for conversion purposes and recommend that the natural area report be rewritten to include most of Section 30 between Benton Creek and South Ridge.

The foremost argument against reserving the old-growth timber in this Section is that it offers the best opportunity to create younger age classes of white pine type mixture. Logging of these stands offers very little in the way of method of cutting studies; the total area of such stands left in the Region is limited and present methods are satisfactory. Nevertheless, the value of the resulting younger age classes for future silvicultural research is a very real one and one that will steadily increase.

Another point to consider in connection with plans for cutting operations is the desirability of establishing a number of plots in various age classes of all timber types of the forest to study ecological succession. The Forest is rich in timber types and stand conditions and offers an excellent chance for ecological studies. Even though finances do not permit such studies at the present time I believe it would be highly desirable to definitely pick areas to be reserved for these studies not only to insure that they will be reserved but also in order that definite areas will be at hand to show ecologists visiting the Station.

The following paragraphs briefly consider the more important of logging possibilities.

North Fork Fox Creek (7)

The basin at the head of the North Fork of Fox Creek is a logging unit. Approximately 90 acres in size it contains a stringer type of overmature white pine, cedar, and defective white fir and hemlock and a mixed type of younger age classes having an overstory of veteran ponderosa pine, Douglas fir, and western larch. It would probably be best to include the complete basin in one timber sale. The stringer type should be clearcut of all merchantable material and complete disposal be made of slash and defective trees followed by planting. The mixed type surrounding the stringer should probably be cut by a selection method in which only the veteran trees are logged. Here all defective trees should be felled and the brush piled and burned. It probably would be good policy to also do a certain amount of hazard reduction work in this area to protect the Experimental Forest from any fires which might originate in the heavy, unburned slash to the south just outside the Experimental Forest boundary.

This logging chance should be the first considered for a timber sale.

Mouth of Canyon Creek (8)

The timber at the mouth of Canyon Creek offers another opportunity for a small timber sale. A patch of overmature white pine type, approximately 5 acres in ~~size~~ could be clearcut and the defective material broadcast slashed and broadcast burned. The veteran ponderosa pine on the slope should be logged to improve growing conditions for younger

age classes. A few merchantable trees, armillaria infected, in the 80 year stand near the creek should also be logged. I believe this area should rank second in priority.

Upper Slope Fox Creek (9)

The area in Section 25 on the south facing slope of South Ridge contains a mixed stand of younger age classes overtopped by veteran ponderosa pine and Douglas fir. The veteran stand should be harvested not only to utilize the timber but also to improve growing conditions for the younger age classes.

Construction of a half-mile logging road would be necessary to log this slope. It may be that the volume of timber cannot justify such an expense.

Lower Benton-North (10)

Much the same sort of stands as those just mentioned are to be found on the south facing slope of Center Ridge west of the Center Ridge road. The Benton Creek road makes the timber quite accessible; no great difficulty should be experienced in logging the veteran ponderosa pine. Once again a selection cutting would be a satisfactory method.

Middle Benton-South (11)

The stand to the south above the upper bridge on Benton Creek is mainly 101-120 years of age and composed of a mixture of pine, cedar, white fir and hemlock. In most of the area pine volume is not great enough to support a logging operation of this one species.

Probably the area should be held until such time as white fir and hemlock can be sold, then clearcut and broadcast burned as there are rather large quantities of defective trees and down material which should be cleaned up.

Upper Benton-South (12)

The area here available for cutting operations depends upon whether any of Section 30 is reserved for a natural area. Aside from whatever decision is made concerning this, considerable merchantable white pine and cedar timber is available for cutting in Section 30.

To log the timber in this Section below the South Ridge road will require construction of a utilization road. The road plan shows a road to be constructed around the slope, but it is not low enough on the slope to catch all the merchantable timber. Probably the road plan location is the best location for long-time utilization purposes but to most efficiently serve the timber as it now exists I believe a lower location, taking off from the switchback as shown on the map might be more suitable.

If the timber in Section 30 south of the South Ridge road is not reserved, I believe it would be desirable to begin cutting and silvicultural operations in this area within the next few years. For example, a portion of the area might be clearcut of all merchantable timber and the remaining stand broadcast slashed and broadcast burned followed by planting. Another portion might be cut to obtain natural regeneration by selling the cedar, disposing of defective hemlock and white fir by felling and piling and burning the slash, and finally logging the white pine after regeneration had become established.

Canyon Creek

A number of chances for logging are to be found in Canyon Creek. Most important are the stringers and patches of old-growth along the many ravines. Small cedar pole logging operations could be carried on to advantage for a number of years.

The veteran ponderosa pine trees on north ridge could also be logged.

Suggested Silvicultural Work Program For Coming Year

A. Timber Sales

1. North Fork Fox Creek Obtain all additional information as soon as possible and prepare timber sale report. If possible, sell timber this fall; if not, log next spring or early summer. Complete all felling of low-value species and all brush piling before fall of 1939 so that brush burning can be completed at that time. Part of disposal of low value species and hazard reduction work to be done by CCC men during coming winter.
2. Mount Canyon Creek Examine area and prepare timber sale report during summer of 1939.

B. CCC Work Program

1. Weedings None.
2. Thinnings Two areas of approximately 20 acres each to be thinned in stagnated stands of Canyon Creek. Three or four treatments from those previously suggested to be used.

For this work to be of permanent research value will require a good deal of technical supervision in laying out the work, in the actual conduct of the thinnings, and in the installation of sample plots. If this supervision cannot be had, the work should not be done.

3. Pruning A small amount of work in early October to establish two pruning plots to study relation of

of pruning to decay. Approximately 100 acres of the south-facing slope of Center Ridge west of the Center Ridge road to be covered; dominant and codominant ponderosa pine 10 inches or less d.b.h. to be pruned. In parts of this area paired trees to be selected one of which will be pruned the other unpruned to study comparative timber quality at maturity.

4. Planting Approximately 10 acres as follows to be planted: the area to be broadcast burned this fall, the flat between the gravel pit and the river, the old Benton Ranger Station site, and portions of the old county road cut off by new construction. Also continuation of arboretum plantings.

5. Broadcast Slashing No new work. The broadcast slashed area on the lower bench to be burned as soon as weather permits. Some work such as fire land construction and selecting and preparing pump sites is necessary before burning.

6. Disposal of Defective Trees Defective trees to be felled and resulting slash to be piled and burned or progressively burned on three small areas totalling approximately 20 acres in the Benton Creek drainage. Location of these shown on map.

7. Timber Sale Area Work Defective trees to be felled and resulting slash to be piled and burned, snags to be felled, and a certain amount of windfall and snow broken material to be burned on

approximately 30 acres of the proposed timber sale at the head of the North Fork of Fox Creek.

8. Miscellaneous A number of odd jobs need to be done. A number of plot, natural area, and direction signs need to be prepared during the winter. Trails to make plots, arboretum and study areas more accessible need to be built.

The following tables summarize the suggested work program for the coming year and show when the various jobs can best be done.

Suggested Silvicultural CCC Work Program For Coming Year

<u>Type of Work</u>	<u>Area in Acres</u>	<u>Estimated Man-Months</u>
1. Weedings	None	None
2. Thinnings	40	60
3. Pruning	100	60
4. Planting	10	10
5. Broadcast Slashing	None	None
6. Disposal of Defective Trees	20	25
7. Timber Sale Area Work	30	15
8. Miscellaneous	None	30
Total		200 (25 men for 8 months)

Schedule of Work

Type of Work
(Refer to Foregoing Table)

	2	3	4	6	7	8	Total
October	: 23	: 2	:	:	:	:	: 25
November†	: 25	:	:	:	:	:	: 25
December	: 10	:	:	:	: 15	:	: 25
January	: 2	: 21	:	:	:	: 2	: 25
February	:	: 23	:	:	:	: 2	: 25
March	:	: 14	:	: 9	:	: 2	: 25
April	:	:	:	: 16	:	: 9	: 25
May	:	:	: 10	:	:	: 15	: 25
Total	60	60	10	25	15	30	200

C. Other

1. Cooperate with Fire to prepare a leaflet for general distribution similar to the Deception Creek leaflet.
2. Prepare material and write-ups for silvicultural show-me trips.
3. Prepare a list of signs to be made up by CCC labor during the coming winter.
4. Select areas to be reserved for the study of ecological succession.
5. If a decision is reached to include additional areas in the natural area, change the report to include the new additions.
6. Examine areas for future silvicultural work and during the late summer of 1939 prepare a work program for the following year.

/s/ C.A. Wellner
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